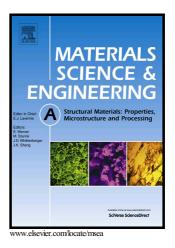
Author's Accepted Manuscript

Tensile Behaviors of Pure Copper with Different Fraction of Nonequilibrium Grain Boundaries

Yunpeng Wang, Ruidong Fu, Lei Jing, Deli Sang, Yijun Li



 PII:
 S0921-5093(18)30444-1

 DOI:
 https://doi.org/10.1016/j.msea.2018.03.086

 Reference:
 MSA36279

To appear in: Materials Science & Engineering A

Received date: 11 November 2017 Revised date: 20 March 2018 Accepted date: 21 March 2018

Cite this article as: Yunpeng Wang, Ruidong Fu, Lei Jing, Deli Sang and Yijun Li, Tensile Behaviors of Pure Copper with Different Fraction of Nonequilibrium Grain Boundaries, *Materials Science & Engineering A*, https://doi.org/10.1016/j.msea.2018.03.086

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Tensile Behaviors of Pure Copper with Different Fraction of Nonequilibrium Grain Boundaries

Yunpeng Wang^{a,b}, Ruidong Fu^{a,b*}, Lei Jing^{a,b}, Deli Sang^{a,b}, Yijun Li^{a,b}

^aState Key Laboratory of Metastable Materials Science and Technology, Yanshan University, Qinhuangdao, Hebei 066004, PR China

^bCollege of Materials Science and Engineering, Yanshan University, Qinhuangdao, Hebei 066004, PR China

*Corresponding author. Tel.: +86 335 805 7047; fax: +86 335 8074545. rdfu@ysu.edu.cn (Ruidong Fu)

Abstract

Pure copper with different fraction of nonequilibrium grain boundaries were achieved by friction stir processing (FSP) under air, water and liquid nitrogen cooling conditions. Tensile behaviors at room temperature exhibited significant difference for above three cases involving different fraction of nonequilibrium grain boundaries. The case with nitrogen cooling showed better combination of strength and elongation for the largest fraction of high energy nonequilibrium boundaries, which contribute to emit dislocations from grain boundaries and suppress grain boundary sliding. Fully relaxed grain boundaries in air cooling samples can suppress the grain boundary sliding and dislocation emission causing high stress and very low elongation. However, appropriate relaxed grain boundaries in the water cooling samples will promote grain boundary sliding and the increase of elongation. The grain coarsening during tensile deformation was observed in those samples with nonequilibrium grain Download English Version:

https://daneshyari.com/en/article/7972458

Download Persian Version:

https://daneshyari.com/article/7972458

Daneshyari.com